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HOUSTON'S ELEMENTS OF CHEMISTRY.

The elements of chemistry; for the use of schools, academies and colleges. By EDWIN J. HOUSTON. Philadelphia, Eldredge, 1883. 444 p., illustr. 8°.

HOUSTON's 'Elements of chemistry' is a brief compilation of the latest facts in regard to the science, arranged for the use of schools, academies, and colleges. Its use will be confined to the first named, or at least to institutions where the rudiments of chemistry are taught. The work is divided into three parts,—theoretical, descriptive or experimental, and organic,—and the arrangement is in most respects good. In the first part the fundamental laws are clearly and concisely stated, and present the subject in a form as well adapted to beginners as we have seen in any text-book. A short description of the different systems of crystallography concludes this portion. In the descriptive part the elements are discussed under the head of non-metals and metals in an order based upon their quantivalence; but the division of the metals into perissad and artiad is not one which most text-books follow. A brief outline is given, in the seventy-five pages of the third part, of the chemistry of the carbon compounds; and the author has succeeded in condensing into this space many important facts; there are, however, several erroneous statements and a general lack of completeness. The division of the carbon compounds into single link, double link, etc., is simply investing an old classification with a new name, and there is no gain in point of clearness.

A large portion of the book, nearly one-fourth, is repetition in the form of a syllabus and questions for review, at the end of each chapter, and, at the close of the book, questions for examination. This seems to be for the purpose of aid, in case the teacher should have had insufficient training in the subject. Indeed, so great is the help afforded, that with it any one with little or no knowledge of chemistry could assume the instruction of a class. We cannot but deplore the introduction of such a system of teaching at a time when it is all-important that chemistry should be scientifically taught in our elementary schools. Instruction in chemistry, to be thorough, should depend upon the teacher, and not upon the text-book. Only a good instructor can impress upon a beginner the necessity for observation, which is the prime requisite for successful work; and a text-book intended to be crammed tends to destroy the sense of observation. The space

devoted to this system could have been profitably devoted to increasing the number of experiments and illustrations of experiments; which last are few and illly executed, and often do not show the best method of conducting the experiment. We object to the use of the Fahrenheit scale and English measures as causing a needless confusion, inasmuch as the centigrade scale and metric system are the accepted scientific notation.

BESANT'S HYDROMECHANICS.

A treatise on hydromechanics. Part i., hydrostatics. By W. H. BESANT, F.R.S., mathematical lecturer of St. John's college, Cambridge. 4th ed. Deighton Bell & Co., 1883. 288 p. 8°.

THIS is "a reproduction, with considerable alterations and additions, of the first part of a treatise on hydrostatics and hydrokinetics, the third edition of which was published in 1877," and is intended as a text-book upon this subject, for those preparing for the mathematical tripos examinations at Cambridge, England. The principal heads treated are, the general conditions of fluid equilibrium; surfaces of equal pressure; resultant pressures; the equilibrium, stability, and oscillations of a floating body (metacenter); the pressure of the atmosphere; the tension of flexible surfaces, and their relation to capillary phenomena; and, finally, the figure of equilibrium of a mass of rotating fluid, acted on by the mutual attraction of its parts. This work requires, as do most of the Cambridge mathematical text-books, that the reader shall have perfect facility in the employment of the differential and integral calculus. There is a plentiful list of examples, selected from previous examination papers, at the end of each chapter. It is perhaps superfluous to speak of the important place which the subject of hydromechanics has occupied in modern mathematical physics since the labors of Helmholtz, Maxwell, and Thomson, in reducing the mathematical treatment of electricity and magnetism to that of the motion of incompressible fluids. This volume is put forth as an introduction to the discussion of fluid motion or hydrokinetics, of which the elements will be given in part ii., which the author hopes to have in readiness early in 1884.

It is a matter of great regret that the state of mathematical training among our colleges is of such elementary character, that there are comparatively few of them where the excellent text-books of this grade can be profitably used by the undergraduates.